Iowa Mathematics & Science Education Partnership

IMSEP 2010-2011

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technology
PLTW
moms night out for stem
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Year III
physics
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CSI
real world externships
Iowa Mathematics & Science Academy

ANNUAL REPORT

IOWAMATH+SCIENCE EDUCATIONPARTNERSHIP
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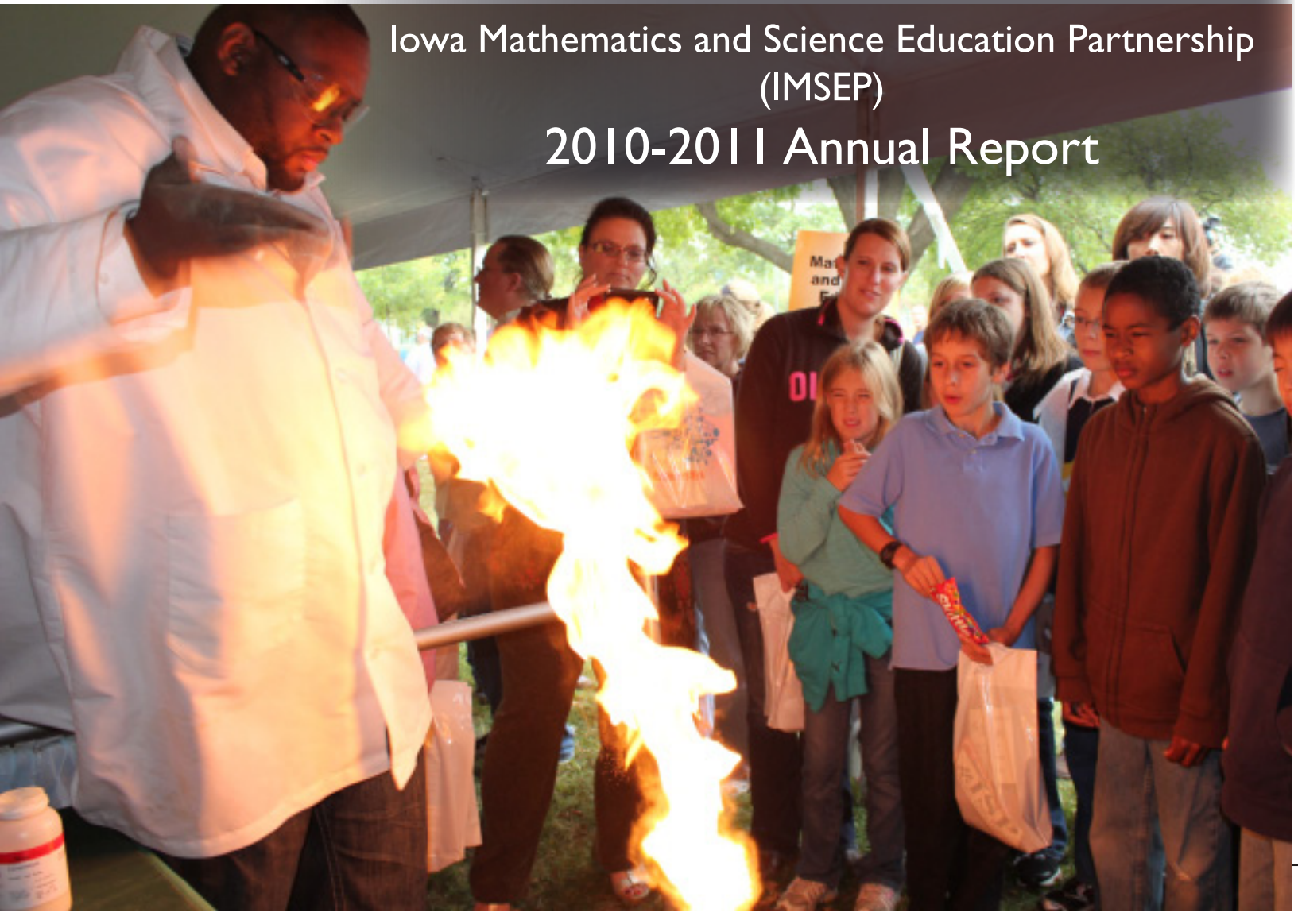
Iowa Mathematics and Science Education Partnership (IMSEP)

2010-2011 Annual Report



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Reflections on Year III

On behalf of the talented faculty and staff of our public universities who make up the Iowa Mathematics and Science Education Partnership (IMSEP) Executive Board, the visionaries who comprise the IMSEP Advisory Council, and the scores of mathematics and science professionals engaged in our partnerships, welcome to a reflection on Year III of the Iowa Mathematics and Science Education Partnership. Together over the course of the year 2010-2011, our accomplishments included:

- *Some 27 STEM-related programs touched the lives of more than 28,000 learners, parents and citizens.*
- *Twenty-six thousand students participated in one or more enrichment programs.*
- *Five-hundred pre-service teachers engaged in an IMSEP program on their journey.*
- *Nearly 1,500 mathematics and science teachers in 185 Iowa communities in 88 counties intersected with IMSEP activities involving over 100 university faculty and staff during 2010-2011.*

These next few pages touch only briefly on highlights of our remarkable year together. Perhaps the greatest compliment that can be paid to the hard work of so many over the last three years is to have our collective efforts branded as foundational to a statewide STEM priority of the Governor, which came to be earlier this fall. This report marks a transition point of greater scope and responsibility for all of us to work together across institutions and entities, to rest only when every Iowan has access to great STEM education and career opportunities. We are humbled to serve you and all Iowans in this charge.

Jeff Weld, Ph.D.
Director

Iowa-Teach: Exploring Mathematics & Science

Our Bolstered, Leaking Pipeline

By fall 2011, through exploratory seminars and scholarships, the *Iowa-Teach Mathematics & Science* program incentivized 286 participants in recruitment programs offered across three universities and three community colleges to consider teaching. And the pipeline has picked up as indicated in Figure I. But our success unearths a cautionary note – about half of the university enrollees who participate in recruitment activities of *Iowa-Teach* opt out of the teaching pipeline (Table III). This table aligns with national indicators of high attrition within teacher preparatory programs (see, for example, the *President's Council of Advisors on Science & Technology's Prepare* and *Inspire*: *K-12 Education in Science, Technology, Engineering*; *Math for America's Future, 2010*; and the Business-Higher Education Forum's *An American Imperative: Transforming the Recruitment, Retention, and Renewal of Our Nation's Mathematics and Science Teaching Workforce*, 2007). Thus, we will conduct an analysis of "leavers" and engage in fresh thinking across preparatory institutions to patch this leak at the mouth of the pipeline.

Table I
Iowa-Teach Seminar Enrollment by Campus and Semester

	UNI	ISU	NIACC	HCC	UI	SWICC
Fall 2011	13	(not offered)	(not offered)	12	7	3
Spring 2011	11	24	6	9	11	5
Fall 2010	19	(not offered)	5	9		
Spring 2010	8	17	5	11		
Fall 2009	20	(not offered)	6	11		
Spring 2009	18	3	18	Pre-partnership		
Fall 2008	26	(not offered)	9			
TOTAL	115	44	49	52	18	8

Table II
Number of Students (undergraduate and graduate) Pursuing Science and Mathematics Teaching at Iowa's Public Universities over the Last Four Years

% change 2007 to 2011		Fall 2011	Fall 2010	Fall 2009	Fall 2008	Fall 2007
+ 20%	Science Teaching	162	165	136	145	135
+ 60%	Math Teaching	198	202	145	137	124

Source: Registrars, BOR enrollment tables, Departmental analysts

Table III
Iowa-Teach Seminar Participants' Status as of Spring, 2011

	At university in math/science teaching	At university, not in math/science teaching	Graduated from university	Still enrolled at CC	Withdrew or unknown
University participants (N=156)	73	64	11*		8
Community College participants (N=89)	14	23		14	38
Totals	87	87	11	14	46

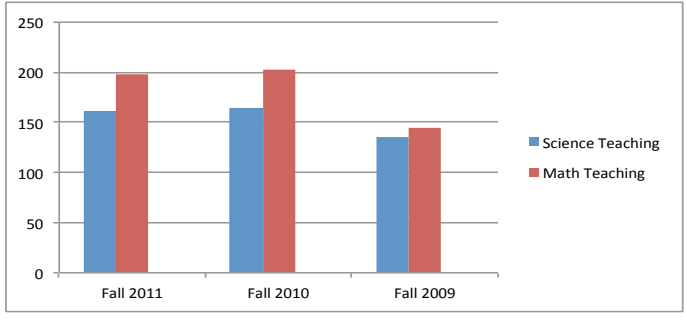
*4 in secondary math or science teaching

An Iowa-Teach recruit presents a math lesson to middle schoolers during a summer day camp.

An Iowa-Teach recruit engages students in doing fractions during her summer internship.

Figure I

Number of secondary science and math teachers-to-be at Iowa's public universities



Southwestern Community College Iowa-Teach seminar student Jonathan Ehrlich

A UNI Iowa-Teach student prepares for another day of math instruction at the Boys and Girls Club in Waterloo.

Iowa-Teach SPOTLIGHT

Jonathan Ehrlich, who is currently finishing an associate degree at Southwestern Community College (SWCC), understands a thing or two about service. As part of the Army National Guard since 2008, Jonathan has either been in training or deployed since 2009. His service to our country isn't the only type of learning he is concerned with. Considering a future teaching science, Jonathan feels that service through learning is very important and will be a huge part of his career.

Currently, Ehrlich is participating in the Iowa-Teach Mathematics and Science Seminar, a program sponsored by IMSEP. "I don't see any reason to turn down free knowledge or training," Ehrlich explained. "More knowledge makes you a better-rounded person and a more qualified individual." As part of the seminar experience, Ehrlich just finished his first field experience in a freshman general science class. "I'm not sure where I need to teach, or to what age. As long as I can teach at a level that will benefit my students and highlight my education, that's where I'll go," he said. "I encourage anyone interested in learning about modern education or in becoming a teacher to participate," he said of Iowa-Teach. While Ehrlich impacts the lives of others both in Iowa and overseas, his dedication to education will clearly impact the future of STEM education in Iowa.

Real World Externships for Mathematics, Science and Technology Teachers

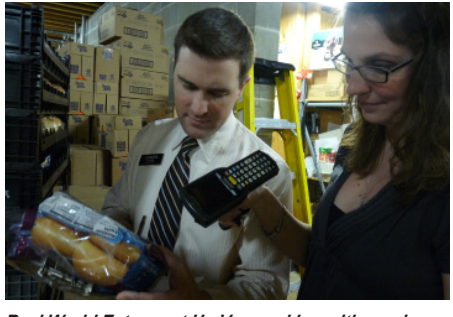
The Future of Science & Mathematics Teaching

Today's teachers carry a broad responsibility – preparing Iowa's youth for productive lives steeped in science, technology, engineering and mathematics. All will need to be literate in these fields to be wise voters, consumers and advocates. Some (hopefully many) will choose mathematics- and science-based careers. Teachers link life beyond the classroom to the here-and-now of students. Classrooms of the future exist here in Iowa, managed by teachers capable of bringing the excitement of STEM as applied "out there" into the lives and lessons of youth who too often wonder, "When am I ever going to need this?"

In the summer of 2011, 50 Iowa secondary mathematics, science and technology teachers accepted an externship in one of over 30 Iowa companies and agencies. Businesses hosting an Extern included Allen Memorial Hospital, Blank Park Zoo, Clipper Wind, Diamond-Vogel Paints, Ellison Technologies, HNI, Hy-Vee, Innovative Lighting, International Automotive Components, John Deere, Kemin, Keystone Electrical, Monsanto, Pella Corporation, POET, Principal Financial Group, Procter & Gamble, Quaker Oats, Rockwell Collins, Syngenta and many others.

Grinnell biology teachers Chellie Wilkens and Sally Kreigel

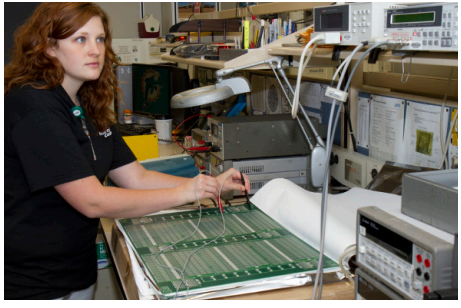
REAL WORLD EXTERNSHIPS



Real World Externs at Hy-Vee working with employees on the store's inventory system

Two-for-One Real World Experience

For six weeks during summer 2011, Sally Kriegel and Rochelle (Chellie) Wilkins, biology teaching colleagues at Grinnell High School, worked together at the Natural Resources Conservation Service (NRCS) in Poweshiek County doing water quality data collection with GPS and other technologies. Throughout their experience, the two were able to build a project based learning (PBL) unit for their classroom that incorporated geo-caching and IOWATER protocol to test water quality. "Through this experience I have had the opportunity to collaborate with my fellow biology teacher at Grinnell High to create something that is interesting, relevant and addresses standards and appropriate content," Wilkins said."The class discussions have been incredible," said Kriegel. "One of my kids said to me, 'I actually want to come to biology. I haven't wanted to go to a science class ever.' I'm not saying this is the magic key," Kriegel observed, "but their interest levels and motivation were piqued."



Teachers who complete Externships are more likely to:

- Implement hands-on problem-solving and scientific investigations.
- Help students investigate possible career opportunities in mathematics or science.
- Integrate the course curriculum with other subjects or fields of study.
- Prepare students for the kinds of expectations they will encounter in a work setting.
- Use more technology in teaching.

The story of IMSEP's *Real World Externships for Teachers of Mathematics, Science and Technology* story is told here: *http://www.iowamathscience.org/educators/externships#what-is*

Externships are made possible through grants from the Iowa Economic Development Authority's Career Awareness Fund and the National Science Foundation's Innovative Technology Experiences for Students program, plus cost-sharing by many Iowa businesses.

***Top Photo**: Des Moines physics teacher John Chai gets to know a llama at Blank Park Zoo during his 2011 Extern experience.*

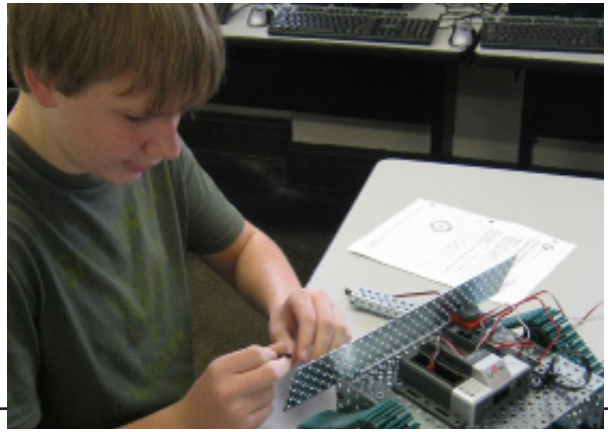
***Middle Photo**: Jennifer Brown, a chemistry teacher from Cedar Rapids, worked as a Rockwell Collins Extern during her 2011 summer break.*

***Bottom Photo**: Iowa City science teacher Doug Herman works with a lab tech at the State Hygienic Laboratory at the University of Iowa as a Real World Extern.*

Project Lead The Way® (PLTW) and Corridor STEM Initiative (CSI)

A Project Lead The Way® (PLTW) Testimonial

According to Mark Matson, a PLTW instructor at Franklin Middle School in Cedar Rapids, Iowa, "innovative and creative solutions" rejuvenated his teaching career. With a background in business teaching, Matson was ready to leave education. At least that was until he was introduced to Project Lead The Way®, an engineering curriculum he knew would be fun to teach and engaging for his students. "PLTW has re-energized my career and I love every minute of it," said Matson. The impact of PLTW in middle school is clear to Matson. "Too often, these kinds of programs have an enrollment of almost all young men and very few young women," he explained. "But by exposing young girls to engineering at an earlier age, getting them excited about those possibilities and encouraging them to pursue their STEM talents will hopefully begin to break down some very old engineering stereotypes." The ability to work toward unique solutions is another aspect of PLTW Matson loves. "The curriculum is exciting and never gets old because my students are allowed the freedom to develop their own solutions to problems," he said. "Students are forced to use their problem-solving skills to create those solutions and that makes them better prepared for a life outside of school." The greatest solution of all, at least for Matson, seems to be STEM education with PLTW.



Members of Matson's PLTW team from Franklin Middle School in Cedar Rapids prepare for competition (above) and another PLTW team member makes last minute changes to the team's robot (below.)

Project Lead The Way® (PLTW)

Iowa's public universities enjoy a unique collaboration on *Project Lead The Way® (PLTW)*. Last year the University of Northern Iowa (UNI) was awarded the first pre-service PLTW site agreement beyond the pilot level. At The University of Iowa (UI) and Iowa State University (ISU), IMSEP grants sponsored the training and professional development of teachers and counselors, certification of the high schools participating in the program, coordination with community colleges and learning opportunities (including college credit) for students participating in the program. PLTW is now offered in 89 high schools and 32 middle schools.

At UNI, IMSEP funds supported the outfitting of an appropriate lab space for offering PLTW courses, the instructional staff support for offering the courses and recruitment/dissemination activities. In spring of 2011, the first cohort of 12 pre-service technology educators completed *Principals of Engineering* (POE) as a component of the certification process. Each student passed *TECH 4178 (330:178) PLTW–POE* with a grade of B- or better; compiled a PLTW–POE Electronic Portfolio and achieved a passing score on the PLTW–POE Final Evaluation.

At ISU, IMSEP funds support staffing, school site visits, summer teacher training, professional development of PLTW teachers and guidance counselors, and dissemination. Program highlights include:

- *Introduction to Engineering Design* (IED) is now a direct substitution for *Engr170,* replacing a required course in Civil Mechanical and Agricultural Engineering majors.
- Seventy PLTW-takers earned ISU credit last year.
- Sixty-three teachers were trained in ED, IED and GTT.
- ISU hosted approximately 100 events impacting 30,000 people where PLTW was promoted.

A Winterset student explains his project at PLTW Day at the Iowa Capitol.

At UI, IMSEP funds supported staffing, summer teacher training, transportation costs and professional development activities such as the PLTW Teacher Conference. Program highlights include:

- One hundred twenty-four Iowa teachers attended the annual conference.
- Fifty-five PLTW teachers took part in updated professional development.
- Thirty-nine teachers were newly certified in PLTW.
- Three hundred forty-four students earned college credit at UI through PLTW last year.

Corridor STEM Initiative (CSI)

Since 2007 the Corridor STEM Initiative (CSI), funded by an IMSEP grant, has served well over 1,000 students in the Iowa City/Cedar Rapids area. In 2011, CSI awarded funding for STEM-focused, after-school programming; the appointment of a "Teacher-In-Residence" to provide professional development for Corridor teachers; and the development of CSI online tools, resources and science kits. "For those schools that partnered with CSI, the children involved are asking better and more in-depth questions the longer they participate," explained Jim Thornton, CSI Coordinator. "They're more capable of using logical and creative thinking skills to solve problems and they look forward to their after-school program." Through CSI, third- through ninth-graders are given extended school programs that are fun and high-quality. "We are hopeful that through our efforts," Thornton said, "more students will pursue STEM careers and come to enjoy the full range of academic courses in those fields."

CSI's Coordinator, Jim Thornton

Eleven Bright Points of Light

Expanded in 2010-2011 to 11 schools (eight elementary and three middle-school), the Corridor STEM Initiative (CSI) brings a wealth of after-school experiences to over 400 children in third- through ninth-grades in the Cedar Rapids/Iowa City area. Many of the sites proactively engage underrepresented students in creative ways, including delivering STEM enrichment on-site at a low-income apartment complex where an area school's high-needs children live. Goals of CSI are to increase awareness and recognition of the need for quality mathematics, science, engineering and technology education for all learners in Iowa; to increase knowledge that the area's workforce must possess in mathematics, science, and technology proficiency and other skills to enhance Iowa's economy; and to cultivate quantity of teachers dedicated to STEM. This year, thanks to the Teacher-in-Residence program and site coordinators at each school, STEM learners across the Iowa City/Cedar Rapids corridor benefitted from such programs as:

- Rube Goldberg Contraption, Bridge Building and Rocketry.
- Medical school tour featuring why not to smoke and why to always wear a seatbelt.
- FIRST LEGO League Robotics and Engineering is Elementary.
- An all-girl mathematics investigation team.
- Spaceflyers and blogs.
- Family Science Night.

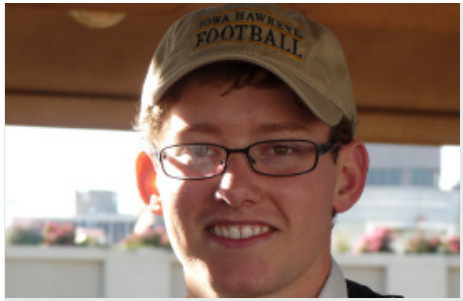
An engineering volunteer works with Hill School students in an after-school program.

Special Events

USA Science & Engineering Festival

Iowa's wind energy leadership and the STEM education of our state that supports renewable energy development were the themes of IMSEP's double booth at the inaugural *USA Science and Engineering Festival (USASEF)*. Our high-traffic corner location on Freedom Plaza, bordered by booths staffed by NASA and a Virginia STEM Academy, brought Iowa to light for thousands of Festival-goers. Highlights were:

- Iowa's exhibit was funded by administrations of UNI, ISU and UI.
- An Iowa team of 17, representing each of our Regent universities plus AEA 10, staffed the exhibit throughout the two-day event in four-person, two-hour shifts.
- An estimated 8,000 visitors explored our Iowa exhibit, based upon the number of giveaways.
- Youth and parents tested windmill designs, created their own "wind power" and designed their own wind turbines through interactive investigations.
- Priceless exposure for Iowa, potential recruits to our universities and exhilarated staffers were the products of the venture.

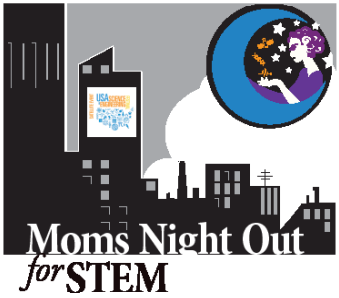


UNI Iowa-Teach student Brice Jensen

Preschool students (above and below) learn about wind energy in IMSEP's booth at USASEF.

A Future Science Teacher sees the Future of STEM

When asked about staffing the IMSEP booth at the inaugural USA Science & Engineering Festival (USASEF), Brice Jensen, a science education senior at the University of Northern Iowa (UNI), said, "It was as exciting as the 1893 World's Fair, where Nikola Tesla lit the entire fair using alternating current electricity." As part of the IMSEP team, Jensen helped to produce interactive and informative activities to engage both children and adults. "We felt that every person who entered our booth left with new knowledge and a better sense of what Iowa is accomplishing in wind power and in STEM education," said Jensen. Held in Washington, D.C., USASEF featured over 750 exhibitors with 1,500 hands-on activities, 75 stage performances and an attendance of approximately 500,000 people. "As a citizen I felt uplifted that the U.S. is still the number one innovator in the world. As a future science teacher, it gave me a sense that science is taken seriously by our government, organizations and schools. I have gained a sense of importance for the material I'll be teaching, knowing I will impact the future of STEM."



Several parents learn to make silly putty at a 2010 Moms Night out for STEM (MNOS) event.

Students get "hands-on" at a MNOS event.

Moms Night Out for STEM

Coinciding with the national *USA Science & Engineering Festival* were 82 state-level "satellite events" across America. *Moms Night Out for STEM (MNOS)* was Iowa's satellite event. Conceived from a conversation between IMSEP and ISU's College of Engineering, *MNOS* recognizes the critical role of family in shaping the confidence and outlook of today's youth when it comes to STEM. Sponsored by John Deere, a franchise-like model was developed by the planning team whereby 19 Iowa sites, ranging from libraries to schools to science centers to business labs, held simultaneous celebrations statewide.

The results of pre- and post-surveys of event attendees showed parents were:

- More inclined to encourage mathematics and science at home.
- More confident about helping with mathematics and science homework.
- More convinced that STEM ought to be emphasized at the elementary school level.

The results of questionnaires of site hosts showed:

- Sixty-eight percent offered hands-on activities to both parents and youth.
- Many were more likely to hold evening STEM events throughout the year.
- One hundred percent of hosts intend to join the 2012 *Moms Night Out for STEM* (whatever form it may take).

IMSEP Functions

iExploreSTEM Festival

Iowa's first statewide family STEM celebration, *iExploreSTEM,* was a joint production of IMSEP and the State Hygienic Laboratory at The University of Iowa. The intent was to nurture interests of Iowa children and families in the exciting fields of science, technology, engineering and mathematics (STEM). Held on the grounds of the State Hygienic Laboratory in Coralville on September 18, 2011, from 1-5:00 p.m., *iExploreSTEM* featured 37 tent-based activities, three mobile labs, an elevator pitch competition, two interactive stage presentations and a tour of the State Hygienic Laboratory. Exhibitors included representatives from universities, corporations, nonprofit organizations, schools, museums and the media. Evaluation highlights include:

- Attendance was ~1300 children and 650 adults, despite inclement weather.
- Adult visitors rated the relevance of STEM to the lives of the youth they brought as 9.4 out of 10.
- Adults rated the overall *iExploreSTEM* experience an 8.7 out of 10.
- Of children surveyed, 82 percent indicated that they had "a lot" of fun and 79 percent said they were more interested in STEM after attending the festival.

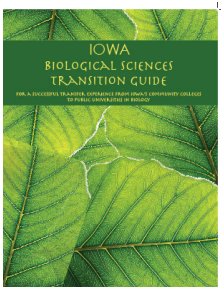
IMSEP STEM-GEM and stock-car driver Thor Anderson signs autographs at iExploreSTEM.

State Hygienic Lab's Beth Hochstedler and iExploreSTEM Event Director Gina Schatteman

How It All Began....

The inaugural USA Science & Engineering Festival (USASEF) proved to be a pivotal point in STEM education for our nation as well as for Iowa. Taking part in USASEF, Gina Schatteman, the director of iExploreSTEM, learned invaluable lessons about what it takes to make an event like this successful. "By working with festival organizers and going to D.C. with IMSEP, I gained new insights into festival planning and the key elements of successful activities," Schatteman explained. "The USA Science & Engineering Festival showed me what I could do when I got back to Iowa." That experience brought about the iExploreSTEM Festival, which began this year in Coralville, bringing about 2,000 people to the event. "The USA Science & Engineering Festival experience and materials were invaluable resources in organizing iExploreSTEM," said Schatteman. "If we hadn't had that experience in Washington D.C., we wouldn't have had near the success we did in our first year." Next year, Schatteman hopes to expand iExploreSTEM, ultimately growing to five locations across the state of Iowa, making it easier for more Iowans to attend.

Events & Outreach



Biological Sciences Transition Guide

A committee of 15 community college and university biologists, facilitated by IMSEP, fulfilled the mandate of House File 815 to aid the transfer success of Iowa's community college students by composing a guide intended for instructors, advisers and students. *The Biological Sciences Transition Guide* consists of essential concepts to command upon transfer, as well as career trajectories and advisements for managing one's own transfer experience. A chemistry guide will be created next. Guides are available at: *http://www.iowamathscience.org/trans-guides.*

Iowa STEM Gems

Iowa professionals engaged in exciting STEM careers and hobbies are great role models for today's youth. A sixth IMSEP STEM Gem was added to the collection in 2011 – Tammy Petro of Integrated DNA Technologies. Tammy, posterized, now graces the walls of mathematics and science classrooms across Iowa, along with Rockwell Collins' Kelly Ortberg, George Washington Carver Academy middle school's Albert Wiggins III, General Mills' Tess Hindman, stockcar driver Thor Anderson and naturalist Amy Carolan.

Iowa Robert Noyce Mathematics and Science Scholars

2010-2011 was Year 2 of a five-year National Science Foundation (NSF) grant program, the *Iowa Robert Noyce Scholarships for Mathematics and Science Scholars,* intended to draw talented upper-level STEM majors into teaching. Nine new awards were made to make a total of 22 undergraduate and graduate scholars participating in the program in its first two years.

Physics Modeling

With funding provided by the Roy J. Carver Charitable Trust, IMSEP was able to sponsor a Physics Modeling workshop for 21 physics teachers from across the state in summer 2011 at Iowa State University. Plans are to replicate the workshop at UI in 2012 and at UNI in 2013.

Iowa Science & Mathematics Teacher Educators Summit — August 11-12, 2011
This third annual Teacher Educators Summit, themed "Cutting Edge Thinking in Mathematics and Science Teacher Preparation," was attended by over 100 faculty members representing 24 Iowa public and private colleges and universities, all of which are in the business of preparing mathematics and science educators for Iowa's classrooms. The summit once again earned a strongly favorable review with summit-goers with an overall rating of 4.37 out of 5 by attendees.

Engineering Education Forum — December 9, 2010
Thirty leading thinkers in engineering education convened at the University of Northern Iowa (UNI) for an open discussion regarding integration of engineering concepts and standards into the mathematics, science and technology curriculum of K-12 schools in Iowa. Motivated by the eventual release of new national science standards infused with engineering design expectations, the group was determined to prioritize parent and community awareness tactics and an infusion of support for elementary teachers to introduce engineering to children. Represented were Iowa's university engineering colleges, science and mathematics departments, community colleges, K-12 schools, AEAs, engineering industries and the Iowa Department of Education.

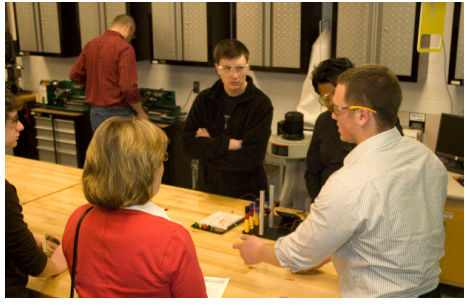
IMSEP Day at the Capitol — February 21, 2011
Thirty-two exhibitors representing higher education, K-12 education, informal education, and business and industry, including such public/private partners as John Deere, Rockwell Collins, Pella Corporation, the Science Center of Iowa and the State Hygienic Lab, spread out across the Capitol rotunda to give legislators a heavy dose of STEM. Iowa has no shortage of talent nor STEM programming, though we face a coverage and coordination challenge.

FIRST Tech Challenge

Girl Scouts BIG Event

FIRST LEGO League

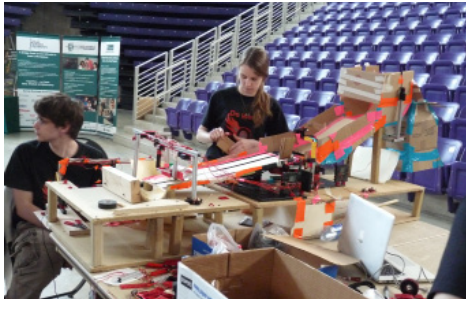
PLTW Lab Day at UNI



UNI Up Close

2011 Solar Splash

State Physics Olympics



Marshalltown Lion's Club

IMSEP Sponsored Programs

In 2010-2011 IMSEP participated in numerous community outreach events including business conferences, career days, student competitions, conferences, civic gatherings and sponsorships, all in the name of STEM education for Iowans.

Governor's STEM Advisory Council

Governor's STEM Advisory Council

The Iowa Mathematics and Science Education Partnership (IMSEP) was elevated to a new responsibility in late 2011 - program arm of the new Governor's STEM Advisory Council. Signed as Executive Order 74 on July 26, 2011, the Governor's STEM Advisory Council, made up of 40 Iowa leaders in education, industry and state government, is charged with advising the Governor's Office on STEM-related items ranging from policy recommendations to classroom practices to public awareness. STEM Council information is available at *http://iowaeducation.iowa.gov/iowa-education-summit/stem/*

Iowa STEM Roadmap

Published in February 2011, the *Iowa STEM Education Roadmap* is a comprehensive baseline status report of the STEM education condition of our state. Compiled by a community of leading stakeholders, it details the areas of STEM education in which our state is strong and in which we have room to grow. Seven targets identified by the *Roadmap* are closely aligned with the action-planning priorities of the Governor's STEM Advisory Council. The *Roadmap* can be accessed at *www.IowaSTEM.org*.

IMSEP by the Numbers

For FY2012, IMSEP took a considerable reduction in funding to $1.8 million. Fortunately, core programming could be maintained by supplemental external funding for some IMSEP activities. A total of $851,458 was invested in IMSEP last year by the following organizations:

- The Roy J. Carver Charitable Trust invested $78,420 in physics professional development.
- John Deere invested $10,000 in *Moms Night Out for STEM.*
- The universities invested a total of $22,500 in the *USA Science & Engineering Festival.*
- Numerous Iowa companies invested $68,738 in *Real World Externships for Teachers of Mathematics and Science.*
- The Iowa Economic Development Authority (formerly the Iowa Department of Economic Development) also invested $125,000 in *Real World Externships for Teachers of Mathematics and Science.*
- The National Science Foundation (NSF) invested $367,000 (of a three year $1.1M grant) in *Real World Externships for Teachers of Mathematics and Science.*
- The National Science Foundation (NSF) also invested $179,800 (of a five year $899,000 grant) in the *Iowa Robert Noyce Scholarships for Mathematics and Science* program.

Dr. Larry Escalada of the UNI Physics Department demonstrates the colors of light at iExploreSTEM festival.

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the program arm for the Governor's STEM Advisory Council and a collaboration of Iowa's public universities in affiliation with STEM education organizations across Iowa

214 East Bartlett Hall • University of Northern Iowa • Cedar Falls, Iowa • 50614-0298 • p. 319.273-2959 • f. 319.273.2779